

DETAILED ACTION

1. Applicant's amendment was received on July 27, 2008. Claims 1, 4, 7, 18, have been amended. Claims 27-30 are new.
2. Applicant's amendment was received on September 25, 2008. Claim 1 has been amended. Claim 4 was cancelled
3. Since the Applicants have cancelled claims 23-28 in the amendments filed on October 16, 2007, these claims are cancelled and not withdrawn.
4. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Election/Restrictions

Applicant's election with traverse of claim 27 in the reply filed on September 25, 2008 is acknowledged. The traversal is on the ground(s) that the species are related or are encompassed by the range and would not caused burden. This is not found persuasive because the species of claim 27 is much different from species in claims 28, 29 and 30. Specifically, species in claim 27 includes -2.5% in which is not included in claims 28, 29 or 30.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

5. The objection on claims 2 and 3 are withdrawn because the Applicants cancelled the claims.

Claim Rejections - 35 USC § 112

6. The rejections under 35 U.S.C 112, first paragraph, on claims 1-12, 16-22 are withdrawn because Applicants have amended the claims.

7. The rejections under 35 U.S.C 112, first paragraph, on claims 1-12, 16-22 are maintained. The rejection is repeated below for convenience.

8. Claim 27 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the recitation "wherein after step (h), the first electrode and the second electrode has a dimensional change of less than -3%" contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art. The specification states that -3% is only measured when there is an absence of dimensionally stable temporary substrates and therefore the combination of claim 1 and 27 is considered new matter.

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 5-8, 10, 21, 22 rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kohler et al. (US Publication 2002/0064593).

Regarding claim 1, the Kohler et al. discloses a process of making an electrode membrane assembly wherein the process of the two catalyst layers are applied to or contacted with the respective surfaces of the polymer electrolyte membrane successively, wherein during the application of contacting process to one surface, the opposite surface of the membrane is always supported (P15). The process includes having a membrane with a first surface that is readily accessible and the second surface of which is supported by a backing film including steps of a) producing the composite of said first surface with the first catalyst layer and a first water repellent gas distribution layer b) removing the backing film from the second surface of the membrane, c) producing the composite of said second surface with the second catalyst layer and the second distribution layer wherein a) comprises two sub steps of a1) coating the first surface of the membrane with the first catalyst layer a2) laying the first gas distribution layer on the still moist catalyst and drying the composite. Step c also comprises two steps c1) coating the second surface of the membrane with the second catalyst layer and c2) laying the second gas distribution layer on the still moist catalyst layer and drying the composite first producing a composite (P21-P32). Furthermore the Kohler et al. discloses when applying the second catalyst layer, the function of the backing may be taken over by the gas distribution layer applied to the first catalyst layer (P15). For

this purpose a fixed composite between the membrane, the first catalyst layer and the first gas distribution layer must be formed before applying the second catalyst layer (P20). It is inherent that the backing layer will be removed once the second catalyst layer is applied and dried because the backing layers are to keep the deformation of the membrane assembly during application of the catalyst layers

Regarding claim 5-8, the Kohler et al. reference discloses the catalyst layers comprises a PTFE dispersion and organic solvent

Regarding claims 10, the Kohler et al. reference discloses a process for membrane electrode assemblies and therefore the steps of production would be repeated as to form multiple electrode layers covering the same part of the membrane (p16).

Regarding claims 21 and 22, the Kohler et al. reference discloses that the backing to made of polyesters (P20).

Claim Rejections - 35 USC § 103

10. The rejections under 35 U.S.C 103 (a), on claims 1-8, 10-12, 16-18, and 20-22 being unpatentable over Marsacq et al. are as evidence by Denton is withdrawn because the Applicants amended the claims.

11. The rejections under 35 U.S.C 103 (a), on claims 9 and 14-15 as being unpatentable over Marsacq et al. as evidence by Denton in view of Lertola are withdrawn because Applicants have amended the claims.

12. The rejections under 35 U.S.C 103 (a), on claims 19 as being unpatentable over Marsacq et al. as evidence by Denton in view of Sompalli et al. are withdrawn because Applicants have amended the claims.

13. The rejections under 35 U.S.C 103 (a), on claims 1, 5-9, 17, and 19-22 as being unpatentable over O'Brien are withdrawn.

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kohler et al. (US Publication 2002/0064593).

The Kohler reference discloses the process step includes compressing the membrane electrode assembly at elevated temperatures (P42). The cathode and anode inks contain predominant solvent (P74). Compression leads to negative forces applied to the electrode assembly and drying leads to loss of water weight in which would cause a decreased dimensional change of the original amount or a decrease from 100%.

Common sense teaches that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of the patents together like pieces of a puzzle. A person of ordinary skill is also a person of ordinary creativity, not an automaton. The question to be answered is whether the claimed invention is a product of innovation or merely the result of common sense, ordinary creativity, and ordinary skill. **KSR v. Teleflex**. Since the process is the same, it would have been obvious to one of ordinary skill to obtain the same product.

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16. Claims 1,5-8, 10-12, 16-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon for English translation) in view of Denton et al. (U.S. Patent 5,716,437)

Marsacq et al. teach a method for preparing an electrode-membrane assembly. Marsacq et al. teach that the electrodes are composed of a Teflon coated porous felt, loaded with carbon black, and covered with a finely divided noble metal such as platinum, as a catalyst (paragraph 11). Marsacq et al. teach applying an electrocatalyst coating to an element comprising a polymer membrane having a first and second surface and a first dimensionally stable temporary substrate where in the coating composition is applied to at least portions of the first surface of the polymer membrane (paragraphs 56-58, as applied to claim 1a). The formed electrode is then dried completely (paragraph 59, as applied to claim 1c). The first dimensionally stable temporary substrate is removed from the polymer membrane (paragraph 60, as applied to claim 1e). The steps are repeated for the second electrode. Marsacq et al. teach applying an electrocatalyst coating composition to at least a portion of the second surface of the polymer membrane (paragraphs 81-83, as applied to claim 1f). The formed electrode assembly is then dried completely (paragraph 83, as applied to claim 1g). The Marsacq et al. reference discloses that the electrocatalyst is applied by casting, the Marsacq et al. reference does not disclose applications of the electrocatalyst by printing, however, and it is known in the art to apply the catalyst onto the electrolyte membrane by known methods such as printing as evidence by the Denton et al. reference (Column 6, Lines 42-53). The substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). When a patent claims a structure already known in the

prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. **KSR v. Teleflex**

Marsacq et al. teach applying the polymer membrane to a first dimensionally stable temporary substrate (paragraph 56). The substrate can be glass, aluminum, polyester, etc., illustrating that the substrate is dimensionally stable (paragraph 117, as applied to claims 21 and 22).

Marsacq et al. teach that the process of applying the polymer membrane to a first dimensionally stable temporary substrate is done by lamination (paragraph 75, as applied to claim 18).

Marsacq et al. teach that the electrocatalyst coating comprises an electrocatalyst, an ion exchange polymer, and a liquid medium (paragraph 11, as applied to claims 5-8). Marsacq et al. teach assembling large numbers of these structures (paragraph 16), which is interpreted as repeating the steps of this process to form multiple electrode layers covering the same part of the surface membrane (as applied to claim 10).

Marsacq et al. teach that the electrocatalyst coating composition and drying steps are repeated to form multiple electrode layers (paragraph 16) that vary in composition and have a non-uniform distribution of the electrocatalyst layer across the electrode layer. Each electrode would contain a slight variation in composition unless a specific process was stated to ensure that each electrode contained the exact composition as the next (as applied to claims 11 and 17). Each electrode would also have a non-uniform distribution because it is impossible to ensure that each electrode

contained the same amount of every material combined to make the layer (as applied to claim 12).

Marsacq et al. teach that the electrocatalyst coating composition applied to the opposite surface of the polymer membrane to form the second electrode is in registration with the first electrode on the first surface (example 2, as applied to claim 16).

Marsacq et al. teach that drying is conducted at ambient temperatures (paragraph 73, as applied to claim 20). There is no specific temperature claimed, even though it is stated in the specification. However, Marsacq et al. teach that the temperature range for drying is between 70°C and 150°C, which is close to the range stated in the specification. Therefore, unless unexpected results for the use of a specific temperature are shown, then Marsacq et al. fit the claimed drying temperatures.

Marsacq et al. do not teach applying second dimensionally stable substrate to a first electrode and then removing it. It would have been obvious to one of ordinary skill in the art at the time of the invention to include a temporary substrate on the surface of the first electrode to protect it from being damage while the rest of the membrane electrode assembly (MEA) was being built. This temporary layer is used only for protection and is eventually removed from the surface after completion of the MEA. By putting this temporary substrate on and then removing it does not show a novelty in the process and due to its lack of criticality (see as how it is removed shortly after application), it is not patentably distinct.

17. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon for English translation) as evidence by Denton et al. (U.S. Patent 5,716,437), as applied to claim 1 above, and further in view of Lertola (U.S. Publication Number 2005/0255372 A1).

The disclosure of Marsacq et al. has been discussed above and is incorporated herein. Marsacq et al. do not teach applying the electrocatalyst coating composition is accomplished by flexographic printing and that applying a nonelectrocatalytic coating over at least part of the same area of the substrate which is covered by an electrode layer. Lertola teaches that the electrocatalyst coating can be applied by flexographic printing (paragraph 45, as applied to claim 9).

Lertola teaches that a protective, abrasion resistant, or sealant layer is applied to the electrode layer (paragraphs 52 and 106). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the electrocatalyst coating through flexographic printing. As evidenced by Lertola flexographic printing is a commonly used technique for applying an electrocatalyst coating. Therefore, it would have been obvious to use this technique to apply the electrodes of Marsacq et al.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the protective, abrasion resistant, or sealant layer of Lertola on the electrode of Marsacq et al. By including this protective, abrasion resistant, or sealant layer, the electrode can be protected from contamination or deformation before use. 18.

18. Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon

for English translation) in view of Denton et al. (U.S. Patent 5,716,437), as applied to claim 1 above, and further in view of Sompalli et al. (U.S. Patent Number 6,524,736 B1).

The disclosure of Marsacq et al. has been discussed above and is incorporated herein.

Marsacq et al. do not teach that the removing in step Id is by peeling. Sompalli et al. teach peeling the substrate off the membrane (column 8, lines 6-8, as applied to claim 19). It would have been obvious to one of ordinary skill in the art at the time of the invention to remove the substrate of Marsacq et al. using a peeling process like the one in Sompalli et al. Removing the substrate could be done in many ways, therefore it would be an obvious choice to peel the substrate off.

Double Patenting

19. The nonstatutory double patenting have been maintained.
20. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *n re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re*

Van Omum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321 (c) or 1.321 (d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

21. Claims 1,5-9, 17, and 19-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 and 18-20 of copending Application No. 10/490,068. Although the conflicting claims are not identical, they are not patentably distinct from each other because the basic concept is the same. In both applications a membrane electrode assembly (MEA) is being made by a flexographic printing method. In application 10/490,068 the MEA is made in a stack starting with a substrate, then a first electrode, a polymer electrolyte, and finally a second electrode. After the entire MEA is made, then the substrate is removed by peeling. In the current application the MEA is made in a two-step process; a polymer electrolyte is applied to a first substrate and then a first electrode is applied to the polymer electrolyte. Then the first substrate is removed, a second substrate is applied to

the first electrode, a second electrode is applied to the other side of the polymer electrolyte, and finally the second substrate is removed. The same product is achieved in both processes with slight modification to the steps used. However, application 10/490,068 is the more cost effective product and would more likely be chosen to be used as a process for making an MEA. The current application does not show a patentably distinct difference from the application 10/490,068, it only adds an added step of applying and then removing a temporary substrate, which is believed to be obvious.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

22. Applicant's arguments filed on June 27, 2008 have been fully considered but they are not persuasive.

Applicants' principal arguments are:

- A) The rejection under 35 U.S.C 112, first and second paragraph, are withdrawn because Applicants have amended or cancelled the claims.
- B) The Applicants argue, "It is respectfully submitted that Marsacq fails to disclose this process of using a second temporary substrate, and hence does not form this claimed sandwich. Thus, Marsacq does not disclose or suggest all the limitations of the Applicants amended Claims" However, the Marsacq reference does disclose that

the process for the first electrode is repeated for the second electrode the temporary (P139-143).

c) The Applicants argue," The Examiner cites Denton as a method of printing an electrocatalyst on a membrane and cures the deficiencies of Marsacq. Denton merely discloses that printing of coatings can be performed and there is no absolutely no indication or any predictability that such printing methods would function in Marsacq's process." However, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The rejections in on claims 9 and 19 also stands.

d) The rejection in regards to O'Brien is withdrawn; however, the Applicants never attached Exhibit D.

e) the nonstatutory obviousness-type double patenting are maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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